Claims

1. (Currently amended) A process for fabricating a semiconductor device, comprising:

applying an immersion lithography medium to a surface of a semiconductor wafer;

exposing a material on the surface of the semiconductor wafer to electromagnetic radiation having a selected wavelength;

applying supercritical carbon dioxide to the semiconductor wafer to remove the immersion lithography medium from the surface of the semiconductor wafer; and

following the step of applying supercritical carbon dioxide to the wafer, obtaining a mixture of the immersion lithography medium removed from the surface and carbon dioxide and recovering and purifying the immersion lithography medium from the mixture.

2. (Original) A process as in claim 1 wherein the immersion lithography medium is a fluoropolymer.

3. (Original) A process as in claim 1 wherein the immersion lithography medium is substantially non-reactive with the material forming the surface of the semiconductor wafer and is substantially transparent to the radiation.

4. (Original) A process as in claim 1 wherein the selected wavelength is in a range from about 11 nm to about 400 nm.

5. (Original) A process as in claim 1 wherein the selected wavelength is about 157 nm.

6. (Original) A process as in claim 1 wherein the material forming the surface of the semiconductor wafer is photosensitive to the selected wavelength.

7. (Cancelled)

8. (Previously presented) A process as in claim 1, wherein recovering includes reducing pressure and/or temperature of the mixture and removing carbon dioxide from the mixture.

9. (Original) A process as in claim 1, wherein exposing comprises passing the radiation through the immersion lithography medium.

10. (Currently amended) A process for fabricating a semiconductor device, comprising:

applying an immersion lithography medium to a surface of a semiconductor wafer;

exposing a material on the surface of the semiconductor wafer to electromagnetic radiation having a wavelength of about 157 nm, the exposing comprising passing the radiation through the immersion lithography medium; ~~and~~

applying supercritical carbon dioxide to the semiconductor wafer to remove the immersion lithography medium from the surface of the semiconductor wafer; and

following the step of applying supercritical carbon dioxide to the wafer, obtaining a mixture of the immersion lithography medium removed from the surface and carbon dioxide and recovering and purifying the immersion lithography medium from the mixture; and

recycling the recovered and purified immersion lithography medium.

11. (Original) A process as in claim 10 wherein the immersion lithography medium is a fluoropolymer.

12. (Original) A process as in claim 10 wherein the immersion lithography medium is substantially non-reactive with the material forming the surface of the semiconductor wafer and is substantially transparent to the radiation.

13. (Original) A process as in claim 10 wherein the material forming the surface of the semiconductor wafer is photosensitive to the selected wavelength.

14. (Cancelled)

15. (Previously presented) A process as in claim 10, wherein recovering includes reducing pressure and/or temperature of the mixture and removing carbon dioxide from the mixture.

16. (Currently amended) A process for fabricating a semiconductor device, comprising:

applying an immersion lithography medium to a surface of a semiconductor wafer, wherein the immersion lithography medium is substantially non-reactive with the material forming the surface of the semiconductor wafer and is substantially transparent to the radiation;

exposing a material on the surface of the semiconductor wafer to electromagnetic radiation having a wavelength of about 157 nm, the exposing comprising passing the radiation through the immersion lithography medium;

applying supercritical carbon dioxide to the semiconductor wafer to remove the immersion lithography medium from the surface of the semiconductor wafer; and

obtaining a mixture of the immersion lithography medium removed from the surface and carbon dioxide and recovering and purifying the immersion lithography medium from the mixture.

17. (Original) A process as in claim 16 wherein the immersion lithography medium is a fluoropolymer.

18. (Original) A process as in claim 16 wherein the material forming the surface of the semiconductor wafer is photosensitive to the radiation.

19. (Original) A process as in claim 16, wherein recovering includes reducing pressure and/or temperature of the mixture and removing carbon dioxide from the mixture.

20. (Original) A process as in claim 16, wherein the immersion lithography medium recovered from the mixture exhibits substantially the same chemical composition and/or substantially the same purity as the immersion lithography medium applied to a surface of the semiconductor wafer.

21. (Currently amended) A process as in claim 1, wherein the immersion lithography medium recovered from the mixture and purified exhibits substantially the same chemical composition and/or substantially the same purity as the immersion lithography medium applied to a surface of the semiconductor wafer.

22. (Cancelled)

23. (New) A process as in claim 1, wherein the immersion lithography medium recovered from the mixture and purified exhibits substantially the same purity as the immersion lithography medium applied to the surface of the semiconductor wafer, and the process further comprises recycling the recovered and purified immersion lithography medium for use in immersion lithography.